

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 August 2003 (14.08.2003)

PCT

(10) International Publication Number
WO 03/067411 A1

(51) International Patent Classification⁷: G06F 3/00, B60K 35/00, B60H 1/00

(21) International Application Number: PCT/SE03/00179

(22) International Filing Date: 3 February 2003 (03.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0200326-7 5 February 2002 (05.02.2002) SE

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

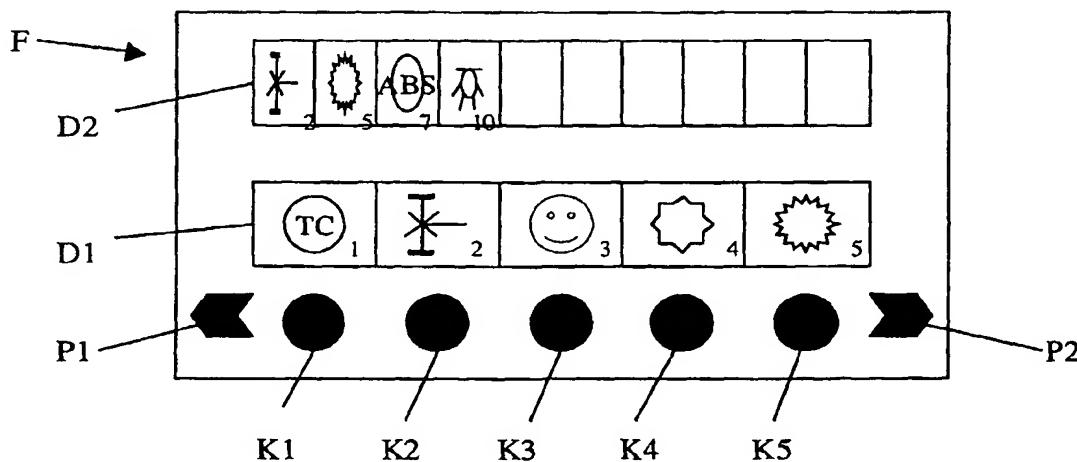
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FUNCTION PANEL



WO 03/067411 A1

(57) Abstract: The invention relates to a function panel (F) for a vehicle, which function panel (F) is designed to control a number of functions in the vehicle and incorporates a display (D1) for viewing at least one function, and at least one button (K1) for activating or switching off at least one function shown on the display (D1), with the function panel (F) incorporating at least one button (P1) for leafing the display (D1) through all the various functions controllable via the function panel (F), and a second display (D2) for continuous viewing of the activated functions.

FUNCTION PANEL**TECHNICAL FIELD OF THE INVENTION**

5 The invention relates to a function panel for a vehicle, which function panel is intended to control a number of functions in the vehicle.

BACKGROUND AND STATE OF THE ART

10 Vehicles, particularly of truck or bus type, have many different functions which a driver of the vehicle has to be able to activate or switch off. All the functions require switches for activation or switching off. New vehicles have ever-increasing numbers of functions, which also increases the number of switches. The switches occupy space and entail costs both for
15 components and for installation.

20 Another problem which may arise is that many of the switches risk being concealed by other components of the vehicle, such as steering wheels or levers, and many may be difficult to reach because of being situated far from the driver owing to shortage of space. A large number of switches spread across the dashboard also make it difficult for the driver to see which switches are activated. Moreover, reliability is reduced by there being a larger number of switches which have to function if all the functions are to be controlled.

25 There have been previous proposals on how to cause a small number of switches to control a number of functions, e.g. in patent specification DE 199 53 863 A1. A problem with the solution therein proposed is that it does not allow the switches to control an unlimited number of functions.

SUMMARY OF THE INVENTION

One object of the present invention is to provide an arrangement whereby one switch or a small number of switches can control an unlimited number of functions and there is good overview of the activated functions. This is
5 achieved by means of a function panel for a vehicle, which function panel is designed to control a set of functions in the vehicle and comprises a display for viewing at least one function of the set and at least one button for activating or deactivating the at least one function shown on the display,
10 with the function panel comprising at least one button for leafing the display through the set of functions controllable via the function panel, and a second display for continuous viewing of activated functions. It thus becomes unnecessary to install separate switches for each function and there is good overview of the activated functions.

15 To further improve the overview, the function panel may with advantage also be adapted to continuously display a list of the set of functions controllable via the function panel, with the functions arranged to be marked on the list when they are activated, thus making it possible to
20 distinguish between activated and deactivated functions.

25 The function panel is designed to be in a state of rest when an ignition system of the vehicle is switched off, and use of the vehicle's functions in that situation may with advantage be facilitated by the function panel being adapted to be able to be activated from the state of rest without the vehicle's ignition system being switched on.

30 To avoid unnecessary leafing, at least one of the most frequently used functions and/or at least one function selected by a user may with advantage be displayed automatically in an initial state of the function panel, in such a

way that at least one of the most frequently used functions and/or the at least one function selected by the user can be activated or deactivated. To the same end, the function panel may with advantage be arranged to display various initial states depending on whether an ignition system for the vehicle is activated or switched off, since a user of the function panel is often interested in different functions depending on whether the ignition system is activated or switched off. The function panel may also be arranged to display different initial states depending on a tachograph setting for the vehicle.

5

The function panel takes with advantage the form of a unit which is adapted to be fitted to a dashboard of the vehicle, is easy to extract manually and is adapted to, after being extracted, be placed in another alternative user position while continuing to be usable for control purposes. This means that a user of the function panel can move away from a position close to the dashboard and yet have access to the function panel. The function panel comprises with advantage a communication unit for wireless communication with a vehicle, thereby further enhancing the user's freedom of movement. If wireless communication is used, the function panel may with advantage incorporate a device for remote control of the vehicle's locks, further enhancing user convenience.

10

To prevent inadvertent starting of the vehicle, the function panel may with advantage comprise an immobiliser.

15

DESCRIPTION OF DRAWINGS

The invention will now be described with reference to the attached drawings, in which:

20

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Fig. 1 depicts a schematic diagram of a function panel according to an embodiment of the invention,

Fig. 2 depicts the function panel in Fig. 1 after one leafing step,

5 Fig. 3 depicts a schematic diagram of the function panel according to another embodiment of the invention,

Fig. 4 depicts the function panel in Fig. 3 in a different initial state.

10 Fig. 5 depicts schematically an embodiment of the function panel fitted in a dashboard.

Fig. 6 depicts schematically an embodiment of the function panel extracted from a dashboard.

15

DESCRIPTION OF EMBODIMENTS

Fig. 1 and Fig. 2 depict a function panel F for controlling a number of functions in a vehicle according to an embodiment of the invention. The function panel F incorporates a display D1 for viewing of five controllable functions. The function panel F also incorporates a second display D2 for viewing activated functions. Below the first display D1 there is a row of five buttons K1-K5 for activating or switching off the function which appears in display D1 above the respective button. The function panel F incorporates two buttons P1 and P2, each on its respective side of the row of buttons K1-K5, for leafing the display through all the various functions controllable via the function panel F. The leafing buttons P1 and P2 have with advantage a special shape, e.g. arrow-shaped as in Figs. 1 and 2, to make it easy to distinguish them from the activating/switching-off buttons K1-K5.

When the driver or another person in the vehicle wishes to activate a function, he/she will use either of buttons P1 and P2 to leaf through the functions until the desired function appears in the display, whereupon the 5 function can be activated by pressing whichever of buttons K1-K5 is directly below the desired function. The same procedure applies to switching a function off. To enable the desired function to be reached quickly, the leafing may with advantage perform, upon each pressing of P1 or P2, the same number of steps as there are buttons K1-K5 usable for 10 activating or switching off. In Fig. 1, the leafing thus takes place five steps at a time, so that pressing P2 once results in the symbols 1-5 displayed on D1 in Fig. 1 being replaced by the symbols 6-10 according to Fig. 2. Another possibility for still faster leafing is to introduce some kind of "fast" command so that the set of five symbols which includes the desired function 15 is accessed immediately, e.g. by pressing a certain combination of buttons. The activated functions 2, 5, 7 and 10 are displayed continuously in D2.

To make it easier to reach the right function, display D2 may be arranged to show not only the activated functions but also a list of the functions 20 controllable via the function panel F, in which case the functions activated may, for example, change colour or be marked in some other way to make it possible to distinguish between activated and unactivated functions. Fig. 3 shows an example of what might be seen when display D2 shows 25 continuously a list of the functions controllable via the function panel. Alternatively, a third display may of course be arranged for continuous viewing of all the functions controllable via the function panel F.

The function panel F controls a desired number of functions in the vehicle, thereby obviating separate switches for each function. New functions can 30 be added by programming them into the function panel so that they can be

leafed through on display D1 and be selected via any of buttons K1-K5 and thereby be able to be activated and switched off without having to install any further switches. The function panel F is primarily conceived for use in vehicles of truck or bus type which traditionally have many different switches for controlling different functions, such as switching off anti-lock brakes (ABS), switching off anti-spin systems (TC), trailer braking, head lamps, interior lighting, air-conditioning systems, sound systems, tag axle lifts, differential lock activation etc. The savings may therefore be substantial in that there will be no need for a separate switch for each function. A problem which may arise is finding suitable locations for all the switches, partly because of limited space on the vehicle's dashboard and partly because switches may easily be concealed by the vehicle's steering wheel and various levers. Reliability is also increased by reducing the number of contact points.

Particularly among drivers of trucks and buses there is a desire that the function panel should not be confusing, with small buttons and symbols. Buttons K1-K5 and P1-P2 should therefore take the form of traditional mechanical buttons of the spring-back type and the symbols on displays D1-D2 should be clear. The symbols on displays D1-D2 replace with advantage the traditional symbols on the dashboard, thereby enhancing the overview in that the symbols are grouped together on the function panel F.

The function panel F may with advantage incorporate a device A for communication with the vehicle's ignition system T and tachograph TCO, as illustrated in Fig. 5, in which the two-directional broken-line arrows symbolise this communication. The device A detects whether the ignition system is on or off and puts the function panel F into a state of rest when the ignition system is switched off. The function panel F may then with advantage be activated from the state of rest without the ignition system

being switched on, e.g. by pressing any desired button. The function panel F may also with advantage display different initial states depending on whether the ignition system is on or off, since users are likely to be interested in different functions in the respective situation, e.g. if the
5 ignition system is on, functions relating to driving, such as brake functions, can be displayed, and if the ignition system is off, other functions, e.g. interior lighting, can be displayed.

The device A may also detect a tachograph setting of the vehicle, i.e. a so-called TCO setting (driving, work or rest) and control the function panel on the basis thereof so that the function panel F may display different states of rest depending on the current tachograph setting. An example of this is
10 illustrated in Figs. 3 and 4, in which Fig. 3 depicts an embodiment of the function panel with D1 in an initial state corresponding to the tachograph being set in the driving position, and Fig. 4 shows the same function panel with D1 in an initial position corresponding to the tachograph being set in the rest position. Fig. 4 also has the number of functions displayed in D2 reduced to those relevant to a user when the tachograph is set in the rest
15 position, thereby facilitating function selection.
20

The function panel F may further with advantage be arranged to detect the functions most frequently used in the various initial states and to display them in the respective initial state. There will preferably be a function
25 which enables a user of the function panel F to save certain functions in the various initial states, e.g. by leafing to a desired function and then saving it in the relevant initial state by pressing for a certain time, e.g. two seconds, the button K corresponding to the function.

30 The function panel F will normally be situated in the dashboard I as depicted in Fig. 5, but may with advantage be fitted therein in such a way as

to be easy to extract manually, i.e. to be able to be fitted and extracted without using tools or the like, so that it can be used for controlling desired functions from alternative user positions, as illustrated in Fig. 6, in which the shaded area S shows where the function panel F can be put back into the dashboard I. The function panel F may, when extracted from the dashboard I, communicate wirelessly via some type of communication unit KOM1 with another communication unit KOM2 in the vehicle so that the function panel can be used for controlling, for example, the interior lighting or an alarm clock or cab heating, from a bunk in a sleeper cab in the vehicle, or for crane work from a platform. The communication between KOM1 and KOM2 is symbolised by the two-directional broken-line arrow in Fig. 6. Alternatively, the function panel F may of course communicate with the vehicle via a lead, with a certain limitation of range depending on the length of the lead. A wireless function panel F may with advantage also incorporate a device L for remote control of locks, such as doorlocks of the vehicle, in which case a reserve key should be incorporated in the function panel F and be recoverable as necessary. The lock cylinder in the passenger door can then be eliminated. With a wireless function panel it is also advantageous to have a search function for preventing the function panel F from being lost. The search function may comprise an acoustic or light signal emitted from the function panel F when a particular button on the dashboard or elsewhere is pressed.

The function panel F may also incorporate an immobiliser for the vehicle so that the vehicle cannot be started until a certain combination of buttons have been pressed. If the vehicle is driven by a number of different drivers, each driver may have his/her own combination whereby the function panel F directly recognises each driver and can adapt the starting state to meet the particular driver's wishes. The immobiliser function may be handled by, for example, the device A for communication between the ignition and the

function panel. The function panel F may also be arranged to remember other functions, such as preferred driving positions, sound system volume, cab temperature etc., and to adapt these parameters to suit the particular driver's wishes.

5

The function panel F communicates with advantage with the control units for the various functions via a CAN network which links the various control units either directly on the CAN bus, i.e. the cables which connect the control units, or via some kind of main control unit. For functions that do not use the CAN bus there may be separate outlets on the function panel F.

10

For the control of functions such as sound and air-conditioning systems, the function panel F may be arranged to display submenus for control of sound volume, temperature levels etc. The technology concerned is known *per se* and is therefore not described in more detail here. Separate controls may of course also be arranged in the dashboard for controlling these functions even if the function panel F according to the invention controls the activation and switching off of the respective functions.

15

The foregoing is not to be regarded as a limitation of the invention but merely as an illustration of possible versions. Many other alternative solutions fall within the scope of what is indicated in the ensuing claims.

20

CLAIMS

1. A function panel (F) for a vehicle, which function panel (F) is adapted to control a set of functions in the vehicle and comprises a first display (D1) for viewing at least one function, and at least one button (K1) for activating or deactivating the at least one function shown on the first display (D1),
5 characterised by at least one button (P1) for leafing the first display (D1) through the set of functions controllable via the function panel (F), and a second display (D2) for continuous viewing of activated functions.

10

2. A function panel (F) according to claim 1, characterised in that the second display (D2) is adapted to display continuously a list of the set of functions controllable via the function panel (F), which functions are arranged to be marked in the list when they are activated, thereby making it
15 possible to distinguish between activated and deactivated functions.

20 3. A function panel (F) according to either of the foregoing claims,
characterised in that the function panel (F) is adapted to be placed in a state of rest when an ignition system of the vehicle is switched off, and that the function panel (F) is adapted to be able to be activated from the state of rest without the vehicle's ignition system being switched on.

25 4. A function panel (F) according to any one of the foregoing claims,
characterised in that at least one most frequently used function and/or at least one function selected by a user is/are automatically displayed in an initial state of the function panel (F) so that the at least one most frequently used function and/or the at least one function selected by the user can be activated or deactivated conveniently.

30 5. A function panel (F) according to claim 3 or 4, characterised in that the

function panel (F) is arranged to display various initial states depending on whether an ignition system for the vehicle is activated or switched off.

5 6. A function panel (F) according to claim 4, **characterised** in that the function panel (F) is arranged to display various initial states depending on a tachograph setting for the vehicle.

10 7. A function panel (F) according to any one of the foregoing claims, **characterised** in that the function panel takes the form of a unit adapted to be fitted to a dashboard in such a way as to be easy to extract manually and which, after being extracted, is adapted to be placed at another alternative point of use while continuing to be usable for control purposes.

15 8. A function panel (F) according to claim 7, **characterised** in that the function panel (F) comprises a communication unit (KOM1) for wireless communication with the vehicle.

20 9. A function panel (F) according to claim 8, **characterised** in that the function panel (F) comprises a device for remote control (L) of locks for the vehicle.

10. A function panel (F) according to any one of the foregoing claims, **characterised** in that the function panel (F) comprises an immobiliser for the vehicle.

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Fig. 1

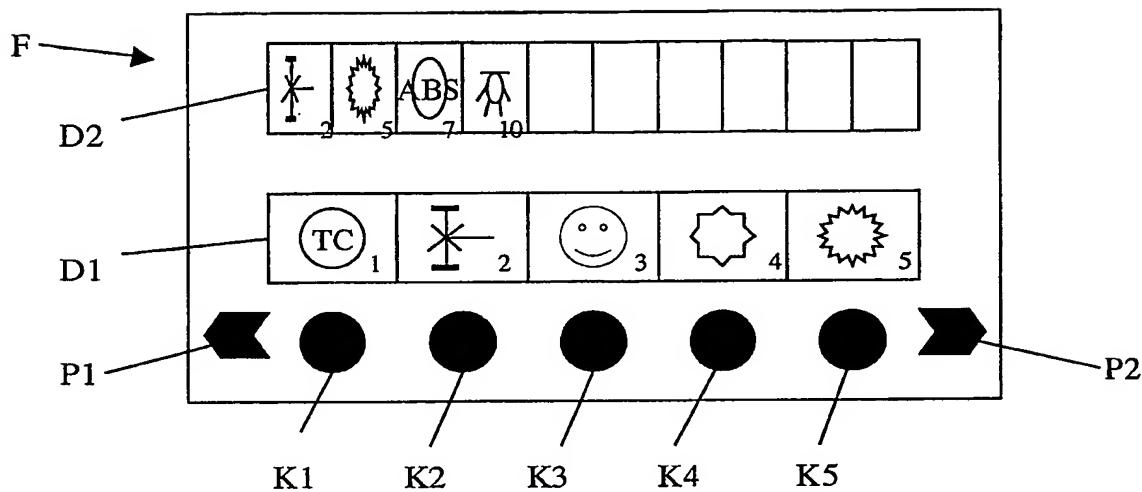
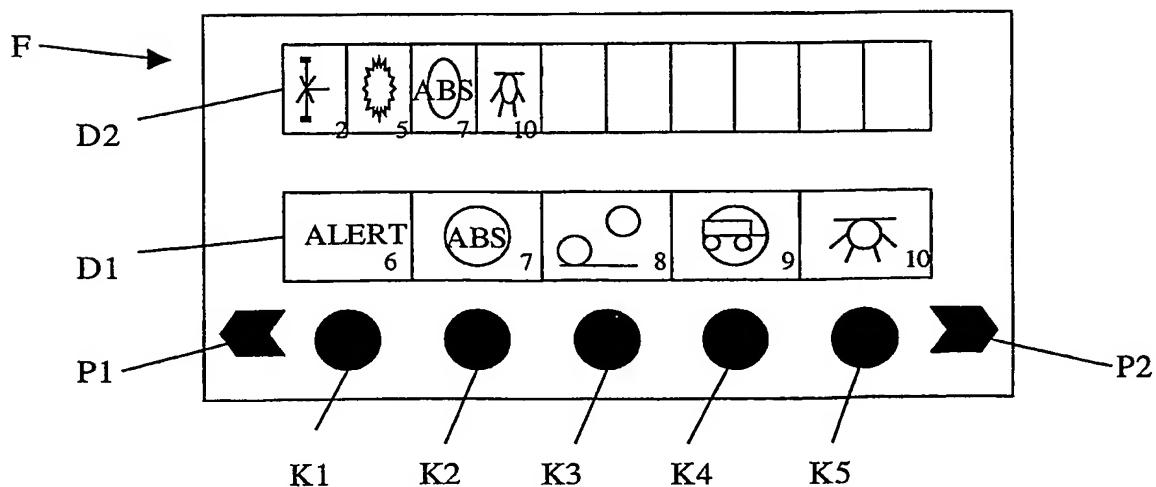


Fig. 2



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Fig. 3

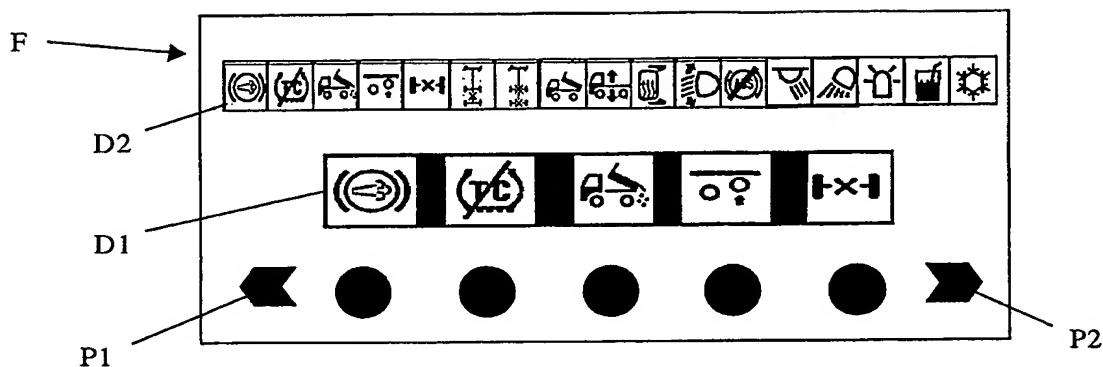
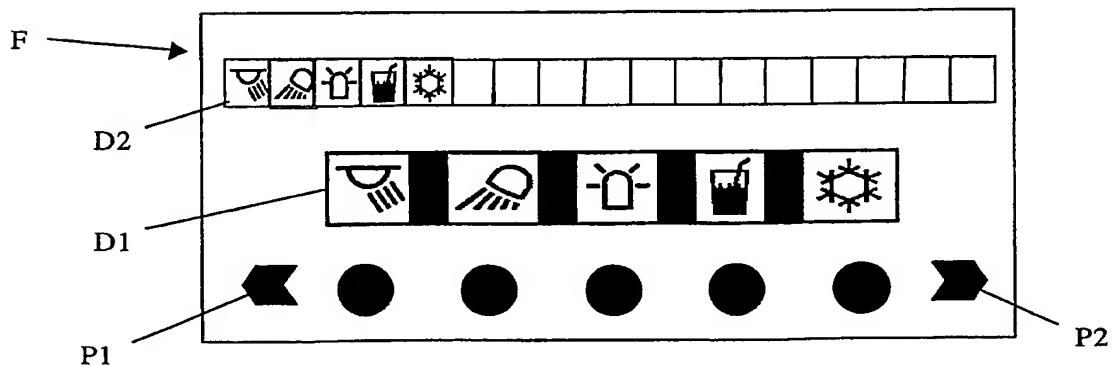


Fig. 4



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Fig. 5

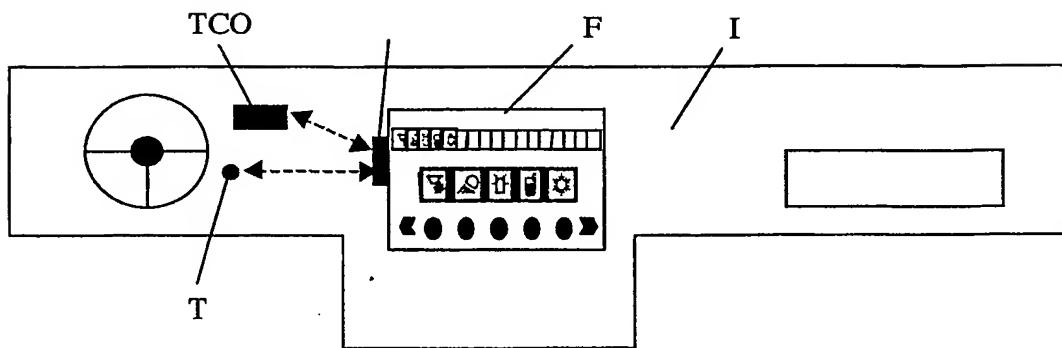
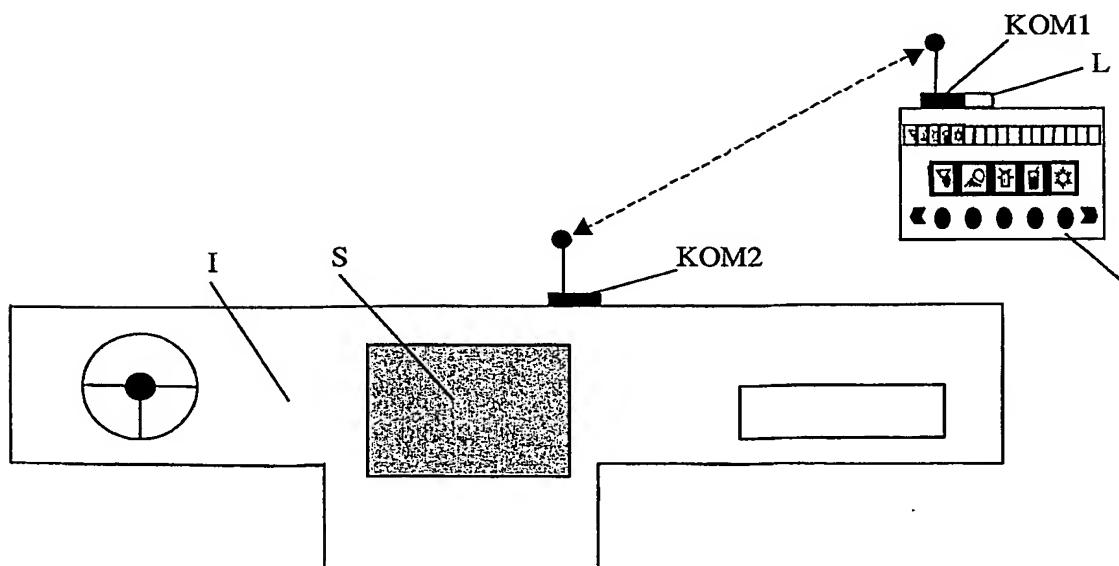


Fig. 6



INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 03/00179

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 3/00, B60K 35/00, B60H 1/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F, B60K, B60H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1125784 A2 (VISTEON GLOBAL TECHNOLOGIES, INC), 22 August 2001 (22.08.01) --	1-10
A	PATENT ABSTRACTS OF JAPAN vol.1999 no.09, 30 July 1999 (1999-07-30) & JP 11 115 465 A (CALSONIC CORP), 27 April 1999 (1999-04-27) abstract -- -----	1-10

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	
"A"	document defining the general state of the art which is not considered to be of particular relevance
"E"	earlier application or patent but published on or after the international filing date
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"X"	document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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Date of the actual completion of the international search	Date of mailing of the international search report
16 April 2003	13-05-2003
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Authorized officer Jan Silfverling /LR Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

29/03/03

International application No.

PCT/SE 03/00179

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1125784 A2	22/08/01	AU 7238500 A JP 2001222349 A	28/06/01 17/08/01